Artificial Intelligence Model Lab

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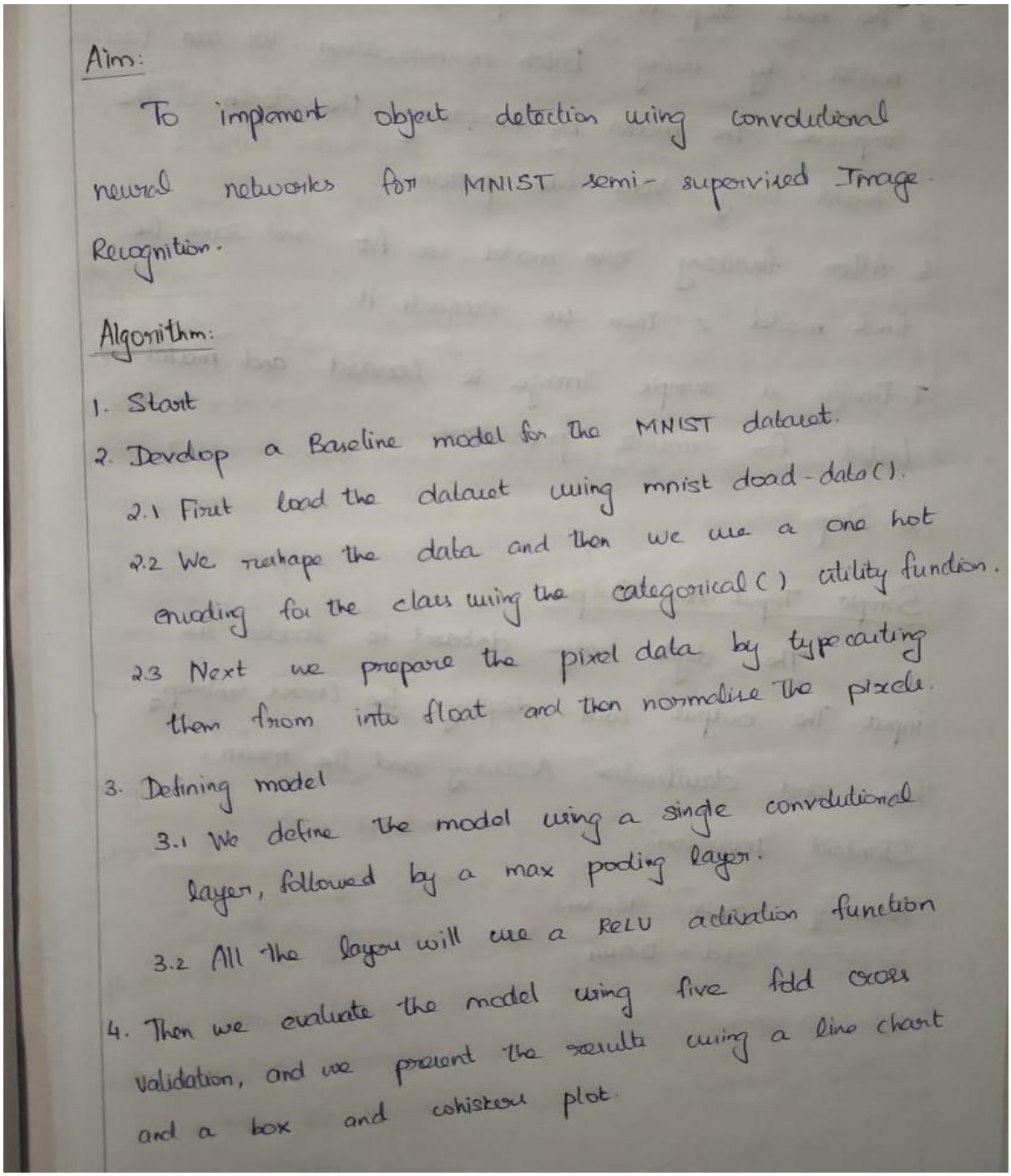
Implement Object Detection (MNIST Semi-supervised Image Recognition) using Convolutional Networks

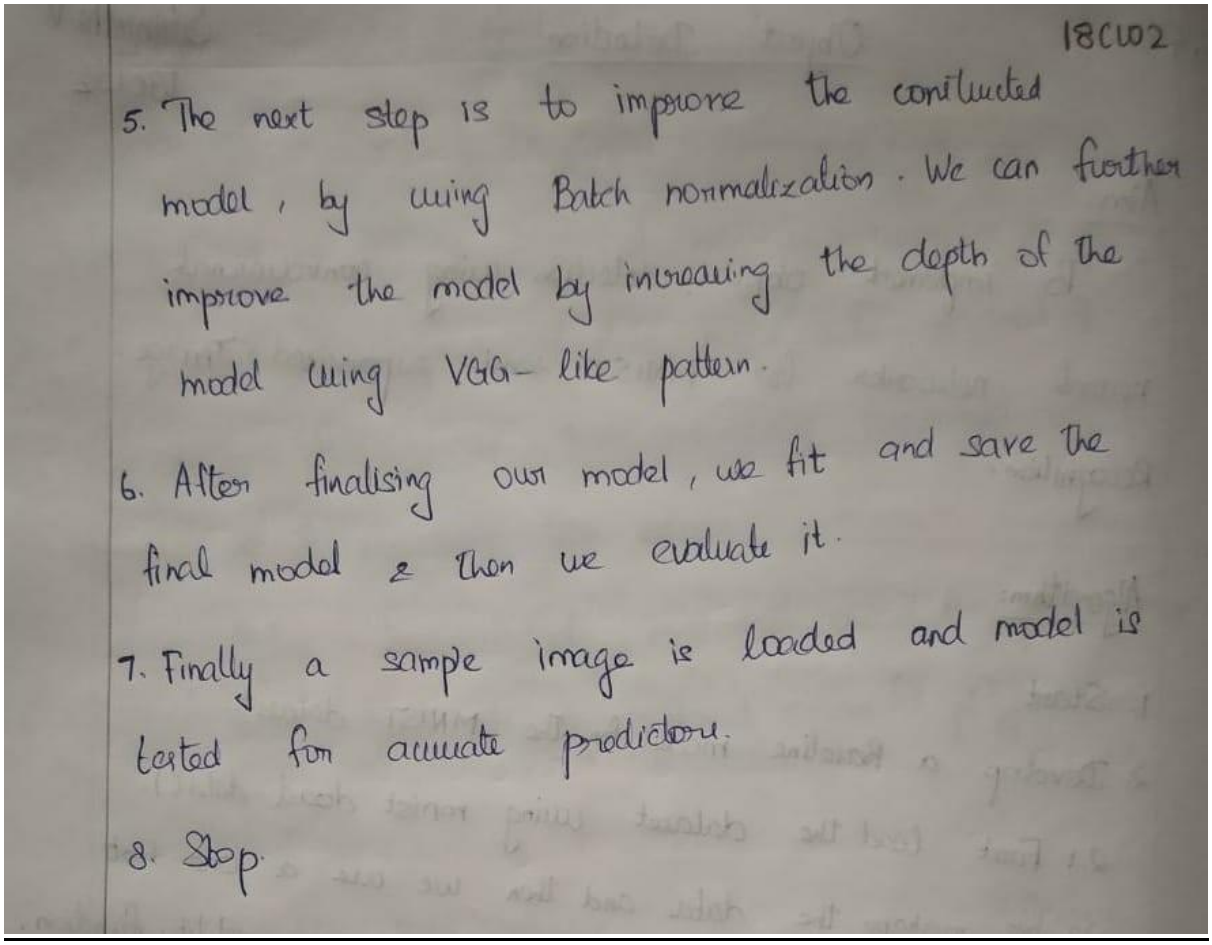


Aim:

To implement object detection using convolutional neural networks for MNIST semi-supervised Image Recognition.

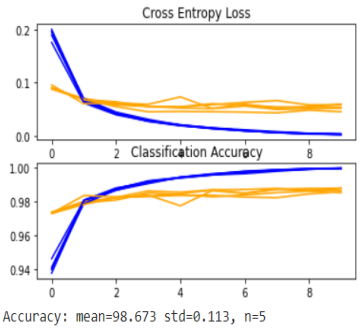
Algorithm:

1. Start
2. Develop a Baseline model for the MNIST dataset.
   2.1 First load the dataset using mnist.load_data().
   2.2 We reshape the data and then we use a one hot encoding for the class using the categorical() utility function.
   2.3 Next we prepare the pixel data by typecasting them from into float and then normalise the pixels.
3. Defining model
   3.1 We define the model using a single convolutional layer, followed by a max pooling layer.
   3.2 All the layers will use a RELU activation function
4. Then we evaluate the model using five fold cross validation, and we present the results using a line chart and a box and whiskers plot.

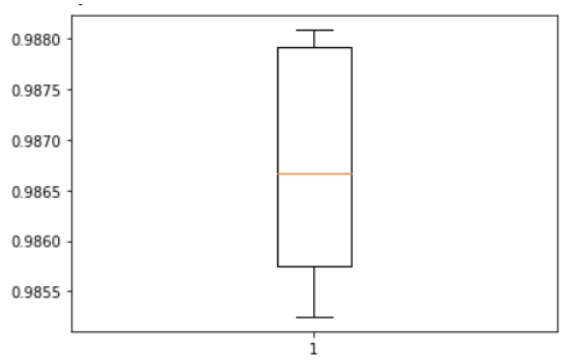


Output:

```
Downloading data from https://storage.googleapis.com/tensorflow/tf-keras-datasets/mnist.npz
11493376/11490434 [==============================] - 0s 0us/step
> 98.525
> 98.667
> 98.575
> 98.808
> 98.792
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:55: MatplotlibDeprecationWarning: Adding an axes using the same arguments as a previous axes currently reuses the earlier i
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:59: MatplotlibDeprecationWarning: Adding an axes using the same arguments as a previous axes currently reuses the earlier i
```




```
Accuracy: mean=98.673 std=0.113, n=5
```



Result:

Thus we have implemented object detection using convolutional networks for semi-supervised Image Recognition.